TECHNICAL REVIEW DOCUMENT OPERATING PERMIT 010PB0238

to be issued to:

Black Hills Colorado, L.L.C. Valmont Combustion Turbine Facility

Boulder County Source ID 0130001

Prepared by Cathy Rhodes February 2003

I. Purpose:

This document establishes the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA, the Public and other interested parties. Conclusions made in this report are based on information provided by the applicant in the Title V application submitted August 21, 2001, subsequent additional information submittals, and review of Division files. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised Construction Permit.

II. Source Description:

This facility consists of two combustion turbine generators (CTGs) configured to operate in a simple-cycle mode (exhaust directly to the atmosphere). Turbine #7 has a nominal electricity production of 38.153 MW at maximum capacity and Turbine #8 has a nominal electricity production of 40.746 MW at maximum capacity. The turbines are used to generate power during intermediate and peak periods of electrical demand and the facility is defined under Standard Industrial Classification 4911. These combustion turbines are part of the Valmont Combustion Turbine Facility, operated by Black Hills Colorado LLC, which consists of combustion turbines and two different operating companies. Coal fired boilers are part of the Valmont Power Plant, operated by Xcel Energy. A

separate Operating Permit has been issued for each operating company, however, for permitting purposes the Valmont Combustion Turbine Facility and the Valmont Power Plant are considered one facility.

The facility is located at 1800 North 63^{rd} Street in Boulder. The area in which the facility is located is classified as attainment/maintenance for particulate matter less than 10 microns (PM₁₀), ozone and carbon monoxide. Under that classification, all SIP-approved requirements for PM₁₀, VOC and CO will continue to apply in order to prevent backsliding under the provisions of Section 110(I) of the Federal Clean Air Act.

These turbines are located at a facility that includes one of the 28 listed sources (fossil-fuel fired steam electric plant of more than 250 million Btu per hour) and therefore, the major stationary source threshold is 100 tons/yr. This source is considered to be a major stationary source (Potential to Emit > 100 tons/year) in an attainment area and has a PSD permit. Future modifications to this facility which are in excess of significance levels as defined in Colorado Regulation No. 3, Part A, Section I.B.58, would result in a major modification and the application of PSD requirements. The Black Hills turbines are considered to be a single stationary source, along with the Public Service of Colorado Valmont Generating Station, although a separate operating permit will be issued to Public Service of Colorado. Facility wide emissions (includes Black Hills and Public Service) and Black Hills only emissions are as follows:

Pollutant	Facility	Black Hills
	Potential to	Potential to
	Emit	Emit ¹
	(tons/yr)	(tons/yr)
PM	2,870	4.0
PM ₁₀	1,509	4.0
NO _X	4,773	39.0
SO ₂	14,691	0.30
CO	545	90.8
VOC	88	6.7

Potential to Emit is based on maximum operation of the Public Service company units and Black Hills permitted emission limits. The Black Hills facility commenced operation in November of 2001, therefore actual emissions have not yet been established.

Rocky Mountain National Park and Eagle's Nest National Wilderness Area are Federal Class I designated areas within 100 kilometers of this facility. There are no affected states within 50 miles of this facility.

This facility certified within the Title V permit application they are not subject to

112(r), the Accidental Release Requirements.

III. Emission Sources:

The following sources are specifically regulated under terms and conditions of the Operating Permit for this Site:

<u>Units CT007</u> - One (1) General Electric (GE) Sprint Model LM6000 Natural Gas Fired Combustion Turbine, rated at a heat input of 328.6 MMBtu/hr, Serial Number . The turbine is equipped with water injection for NOx emissions control. The unit is equipped with a 5 MMBtu/hr natural gas fired heater to prevent formation of ice crystals in the turbine air inlet during extreme winter conditions.

<u>Unit CT008</u> – One (1) GE, Enhanced Sprint Model LM6000 Natural Gas Fired Combustion Turbine, rated at a heat input of 343.0 MMBtu/hr, Serial Number. The unit is equipped with a 6.5 MMBtu/hr natural gas fired heater to prevent formation of ice crystals in the turbine air inlet during extreme winter conditions.

1. Applicable Requirements – Initial Approval Construction Permit 99BO0474 was issued for these sources. The due date of the first semi-annual monitoring and deviation report required by this operating permit will be more than 180 days after the initial approval construction permit 99BO0474 was issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Part C, Section V.A.2, the Division is allowing the initial approval construction permit to continue in full force and effect and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section IV.H and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit. The following applicable requirements have been identified for these units:

Construction Permit 99BO0474

- Visible emissions shall not exceed twenty percent (20%) opacity. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 5b and Colorado Regulation No. 1, Sections II.a.1 & 4). Note: The operating permit condition reflects the specific Regulation No. 1 language for this applicable requirement.)
- Limits total criteria pollutant emissions from turbines and air inlet heaters on a quarterly basis for the first twelve months of operation and on a rolling twelve month basis thereafter (Condition 1) (Note: The facility has operated for more than one year, therefore the quarterly emission limits no longer apply, and are not included in the operating permit.)

- Limits total amount of natural gas consumed by all equipment. (Condition 2) The permittee has requested that the specific consumption limit be eliminated. The operating permit contains a revised condition which limits natural gas consumption based on the emission limits
- Limits insignificant activity emissions of each criteria pollutant to one ton per year (Condition 3)
- The turbines are subject to Regulation No. 6 Standards of Performance for New Stationary Sources, Part A - Federal Register Regulations Adopted by Reference, Subpart GG - Standards of Performance for Stationary Gas Turbines, including but not limited to:
 - o $NO_X < 117.8$ ppmvd at 15% oxygen.
 - o $SO_2 < 150$ ppmvd at 15% oxygen.
 - o Fuel consumption and water-to-fuel ratio will be continuously monitored and recorded (Note: The operating permit requires use of the CEM to monitor compliance with the NOx emission limit)
 - Sulfur and nitrogen content of the fuel being fired in the turbines shall be monitored as specified in this Subpart GG (Note: The permittee requested, and received a waiver from nitrogen monitoring, because pipeline quality natural gas will be used as fuel. For sulfur monitoring, if little variability in sulfur content occurs during the first six months of monitoring, then sulfur monitoring can be conducted guarterly. If after at least six guarters there is still little variability in the fuel sulfur content, then sulfur monitoring can be done semi-annually. The EPA has approved ASTM D 5504-94 as a primary method for sulfur monitoring and ASTM D 5453-93 as a backup method for sulfur analysis rather than the methods set forth in Subpart GG.) Under the NSPS provisions, the EPA must approve alternative test methods. (Condition 4)

- The turbines are also subject to the requirements in 40 CFR Part 60 Subpart A – New Source Performance Standards – General Provisions, as adopted by reference in Colorado Regulation No. 6, Part A, the following will be included in the permit (condition 10):
 - o Good practices (§ 60.11(d))
 - o Circumvention (§ 60.12)

(Condition 4d)

- The turbines are subject to Colorado Regulation No. 6, Part B, II.C and D
- The source is subject to Regulation No. 6 Standards of Performance for New Stationary Sources, Part B - Specific Facilities and Sources, Non-Federal NSPS, II.C & D – Standards of Performance for New Fuel-Burning Equipment – Standard for Sulfur Dioxide – Combustion Turbines

(Condition 5a). These are state-only requirements.

- o SO₂ emissions shall not exceed 0.35 lbs/mmBtu.
- o Opacity of emissions shall not exceed 20%
- The source is subject to Reasonably Available Control Technology (RACT) requirements for VOC, CO and PM₁₀ (Colorado Regulation No. 3, Part B, IV.D.2.d and Condition 5.a)
 - o Good combustion practice and use of pipeline quality natural gas
 - o Requires the permittee to monitor and control operating parameters which consitute good combustion practices (Condition 10)
- Compliance tests for NOx and CO. (Condition 6)
- Each turbine will be equipped with:
 - o Natural gas fuel flow meter
 - o CEM systems for NOx and CO concentrations and O₂ in accordance with 40 CFR Part 75 and Part 60, Appendix F

(Condition 7) Note: The Construction Permit incorrectly requires NOx to be monitored on a 24 hour basis. The operating permit is corrected to require hourly monitoring.

Other applicable requirements not included in 99BO0474

- Particulate matter emissions from each turbine shall not exceed the limitations in Reg 1, Section III.A.1.b
- Sulfur dioxide emissions shall not exceed 0.35 lbs/mmBtu, on a 3-hour rolling average (Reg 1, Section VI.B.4.c.(ii) and VI.B.2)
- Both units are subject to the Acid Rain requirements as follows:
 - o Allocated SO₂ allowances are listed in 40 CFR Part 73.10(b), however, since these are new units, no allowances were allocated. SO₂ allowances must be obtained per 40 CFR Part 73 to cover SO₂ emissions for the particular calendar year.
 - o There are no NO_X emission limitations since these units are not coal-fired boilers.
 - o Acid rain permitting requirements per 40 CFR Part 72.
 - o Continuous emission monitoring requirements per 40 CFR Part 75.
 - o This source is also subject to the sulfur dioxide allowance system (40 CFR Part 73) and excess emissions (40 CFR Part 77).
- MACT Requirements: The EPA signed the final MACT rule for turbines on August 29, 2003. Under the final rule, existing turbines are not subject to MACT. The turbines at this facility are existing turbines as defined in the MACT rule, therefore they are not subject to the MACT requirements.
- 2. Emission Factors- Emissions from these turbines are produced during the combustion process, and are dependent upon operating conditions and specific properties of the natural gas being burned. The pollutants of concern

are Nitrogen Oxides (NO_X), Carbon Monoxide (CO), Volatile Organic Compounds (VOC) and Particulate Matter (PM and PM_{10}). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted dependent upon the makeup of the fuel and combustion efficiency. Emission limits from the turbines were established using manufacturers' data (except for SO_2). Manufacturer's data were also used to estimate emissions from the air inlet heaters. CEMs will be used to monitor compliance with NOx and CO limits. SO_2 emissions from the turbines are based on the EPA default emission rate of 0.0006 lb/MMBtu from 40 CFR Part 75, Appendix D.2.3.2 (Acid Rain provisions).

3. Monitoring Plan- The source shall be required to monitor compliance with the emission limits by monitoring fuel consumption and using emission factors based on heat input. The source shall be required to record fuel consumption and calculate emissions monthly.

The continuous emission monitoring systems shall be used to monitor compliance with the annual NO_X and CO emission limitations. The monitoring methods required by 40 CFR Part 75, Appendix D shall be used to monitor compliance with the SO_2 emission limitations.

The heat content of the natural gas shall be determined monthly through either sampling and analysis or use of vendor analyses. In the absence of credible evidence to the contrary, compliance with the opacity, particulate matter and Reg 1 SO₂ limits shall be presumed provided natural gas is used as fuel.

4. Compliance Status- The permittee indicated in their application that they are in compliance with all applicable requirements.

IV. Compliance Assurance Monitoring (CAM) Requirements

The turbines are equipped with enhanced water injection to control NO_X emissions. Since the turbines are not large pollutant specific emission units (i.e. potential controlled emissions, including limits in the Construction Permit, are less than 100 tons/year of NOx), the applicant is not required to submit a CAM plan until the permit is renewed (if applicable). Since the operating permit will require the use of CEMs, it is expected that CAM will not apply at the time of permit renewal. Therefore, in accordance with the provisions of 40 CFR Part 64, as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV, the turbines are not subject to the compliance assurance monitoring *CAM) requirements.

V. Alternative Operating Scenarios (AOS)

The permittee requested an AOS in order to replace permitted turbines with like-kind turbines. The permit includes the Division's AOS for temporary replacement of turbines. Because any new turbine would be subject to the RACT provisions, and RACT is a case-by-case determination that can change over time,

permanent replacement of a turbine can not be accommodated under an AOS for this facility.

VI. Acid Rain Provisions:

Both turbines and duct burners are affected units under the Acid Rain Program which is governed by 40 CFR Parts 72, 73, 75, 76, 77 and 78 and as such the source is required to have provisions for the Acid Rain requirements in its Title V permit. Units subject to the Acid Rain requirements are required to hold adequate SO_2 allowances and have NO_X limitations. This facility is not listed under 40 CFR 73.10(b)(2) and therefore must obtain SO_2 allowances as needed. Since these units are not coal-fired boilers, they do not have any NO_X limitations under the Acid Rain Program.

Typically, units subject to the Acid Rain requirements are required to continuously measure and record emissions of SO_2 , NO_X (with diluent monitor either CO_2 or O_2) and CO_2 as well as opacity and volumetric flow in accordance with the requirements in 40 CFR Part 75. Since these units burn natural gas, these units are not required to have a continuous opacity monitor and can use an alternate monitoring method (Appendix D), in lieu of installing and operating a continuous emission monitor for SO_2 .